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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,236	10/28/2003	Thomas Lloyd Credelle	8831.0056-01	5279

42304 7590 10/17/2006

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EXAMINER	
MOON, SEOKYUN	
ART UNIT	**PAPER NUMBER**
2629	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/696,236	CREDELLE, THOMAS LLOYD	
	Examiner	Art Unit	
	Seokyun Moon	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/4/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) has been acknowledged.

Information Disclosure Statement

2. The information disclosure statement (IDS) received on August 04, 2006 has been acknowledged and considered by the Examiner. Initial copy of form 1449/PTO is included in this correspondence.

Response to Arguments

3. Claim Objections

Claims 1 and 10 were objected to as including minor informalities in the Non-Final Office Action mailed on May 04, 2006. The claims were amended in the Amendments mailed on August 04, 2006. Accordingly, the objections have been withdrawn.

4. Claim Rejection under 35 U.S.C. 112

Claims 1, 6, 8, 13, and 15 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The claims were amended in the Amendments mailed on August 04, 2006. Accordingly, the rejections have been withdrawn.

5. Claim Rejections under 35 U.S.C. 103

As to the rejections of **claims 1**, **8**, and **15**,

The Applicant disagreed with the Examiner's interpretation of the claim limitation of "*a repeating subpixel group*". However, the Examiner submits that there is nothing in the claim precluding the Examiner to interpret "*a repeating subpixel group*" in such way as disclosed in the previous rejection. As the Examiner interprets the claim limitation, "*a repeating group*", the claim limitation merely indicates "*a group of subpixels being repeated on a display panel*", which is consistent with the Examiner's interpretation disclosed in the previous rejection. Thus, the Examiner respectfully submits that the Applicant's arguments with respect to the interpretation of "*a repeating subpixel group*" disclosed in the rejection of claim 1 are not persuasive.

The Applicant pointed out that Mori's subpixel group as interpreted by the Examiner is not repeated [Remarks: pg 19]. However, as clearly shown on page 5 of the Non-Final Office Action, the Examiner indicated two rows of four subpixels ("*BGGB*" and "*BRRB*") as a repeating group rather than indicating one row of four subpixels ("*BGGB*") as a repeating group. Accordingly, as disclosed in the previous rejection [Office Action: pg5 drawing 1], Mori's subpixel group is repeated on a display panel. Thus, the Examiner respectfully submits that the Applicant's arguments with respect to "*repeating*" of "*subpixel group*" are not persuasive.

The Applicant pointed out four problems with the analysis of the asserted combination of Mori and Okuzono disclosed in the previous rejection [Remarks: pg 23]. Regarding the first problem out of the four problems, the Applicant stated that Okuzono explicitly teaches away from localizing image degradation since Okuzono is concerned with eliminating image degradation. However, the Examiner submits that the Examiner didn't interpret Okuzono's horizontal striping as the image degradation disclosed in the claims. For the asserted combination of Mori and Okuzono, the Examiner merely adopted Okuzono's driving method in Mori in order to prevent the horizontal striping. The asserted combination of Mori and Okuzono would result in having image degradation to be localized on a column of blue subpixels. Thus,

the Examiner respectfully submits that the Applicant's arguments with respect to Okuzono's teaching of eliminating image degradation are not persuasive.

Regarding the second problem, the Applicant pointed out that the dot inversion schemes discussed in Okuzono appear to be relevant to a standard RGB stripe display, and not to the alternative subpixel configurations disclosed in Mori [Remarks: pg 24]. However, the specification of the display discussed in Okuzono provided by the Applicant [Remarks: pg 24] is mere a sample specification elected to explain the driving principle of display rather than a required specification. Furthermore, there is nothing in the Okuzono precluding the Examiner to use Okuzono's driving method in Mori's display. Thus, the Examiner respectfully submits that the Applicant's arguments with respect to adopting Okuzono's driving method in Mori's display are not persuasive.

Regarding to the third problem, the Examiner thanks to the Applicant for acknowledging that 1 x 2 dot inversion is well known in the art for a display. However, the Examiner submitted Okuzono to provide more precise motivation for adopting 1 x 2 dot inversion in Mori.

Regarding to the fourth problem, the Applicant pointed out that Mori teaches a subpixel arrangement preventing horizontal striping [Remarks: pg 25] and thus a person of ordinary skill in the art at the time of the invention would not look to the Okuzono reference for any teachings, since the Okuzono reference is concerned with a technique for eliminating horizontal striping. However, the Examiner submits that the factor causing the horizontal striping or the vertical striping in Mori is different from the factor causing the horizontal striping in Okuzono. In Mori's display device, the horizontal striping is caused by luminance irregularity regarding the number of pixels in a display while in Okuzono's display, the horizontal striping is caused by charging of the drain line. Since Mori's display doesn't have any function or feature preventing the horizontal striping caused by charging of the drain lines, it would have been obvious to one of ordinary skill

in the art at the time of the invention to use Okuzono's driving technique in Mori's display device. Thus, the Examiner respectfully submits that the Applicant's arguments with respect to implementing Okuzono's driving method in Mori's display are not persuasive.

The Applicant pointed out that mere duplication of a 1 x 2 dot inversion scheme to a subpixel repeating group having an even number of subpixels in a row will not prevent visual degradation and other problems. However, the Examiner submits that the Applicant has failed to disclose such aspect of the invention, preventing visual degradation and other problems, in the claims. Furthermore, the image degradation disclosed in the claims is caused when the subpixels having a same color are adjacent to each other and are driven with a same polarity ,and therefore the asserted combined device of Mori and Okuzono would result in localizing the image degradation on blue subpixels. Thus, the Examiner respectfully submits that the Applicant's arguments are not persuasive.

As to the rejections of **claim 6**, **13**, and **20**,

The Applicant pointed out that since Okuzono is interested in eliminating horizontal striping and makes no mention of modifying the polarity scheme to accomplish the striping elimination, it would not be obvious to one of ordinary skill in the art to learn from Okuzono how to select the phases of the driver circuit. However, in the previous rejection, the idea of combining Mori and Okuzono is based on adopting Okuzono's driving method including the two line dot inversion in Mori, not just on adopting Okuzono's two line dot inversion. Furthermore, as shown in Okuzono's figures 5 and 6, depending on the type of the inversion driving method, Okuzono's driving waveforms for the display are changed. Thus, the type of inversion driving method is critical in Okuzono for determining the type of the driving method for the display. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Okuzono's driving method including a two-dot line inversion in Mori since the

driving method of Okuzono having two-dot line inversion is one of plural aspects of Okuzono's invention. Thus, the Examiner respectfully submits that the Applicant's arguments are not persuasive.

As to the rejections of **claims 3**, **10**, and **17**, the Applicant's arguments filed on August 04, 2006 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, distributing different color emissions uniformly on a display panel is generally well known to one of ordinary skill in the art at the time of the invention.

As to the rejections of **claims 4**, **11**, and, **18**, the Applicant pointed out that it makes no sense for source driver 9 to be a column driver commonly shared by all of the columns of pixels on the display since the image data may be different for each pixel in each column. However, the Examiner submits that the claims merely disclose sharing a column driver not a column or data line. Okuzono teaches that plural pixels in each column are connected to a source driver, which indicates that all the pixels in all columns share a driver. There is nothing in the claims specifying the characteristics of the column driver and thus precluding the Examiner from interpreting Okuzono's source driver as a column driver. Furthermore, if the aspect of the invention, "*sharing a same column driver*" is interpreted in a way as mentioned in the Arguments [Remarks: pg 34], all the pixels sharing a column driver in the invention are to be driven with

same image data, and thus to display same image, which makes no sense, neither. Therefore, the Examiner respectfully submits that the Applicant's arguments are not persuasive.

As to the rejections of **claims 5**, **7**, **12**, **14**, **19**, and **21**, the Applicant pointed out that the Examiner's statement with respect to the motivation for applying Nakano's correction technique to Mori's display is merely a conclusion that fails to indicate which reference provides the motivation, suggestion, or teaching to make the asserted combination. The Examiner has cited Nakano's paragraph number disclosing the motivation of using Nakano's correction technique in this correspondence.

Claim Rejections - 35 USC § 112

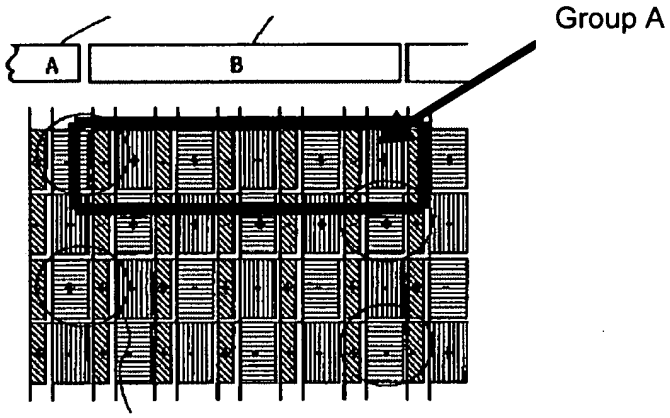
6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 24-26** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The aspect of the invention disclosed in the claims, "*any parasitic effects placed upon any of the subpixels are placed substantially upon the subpixels disposed at a boundary of the driver chip*" is not consistent with the aspect of the invention disclosed in the specification. According to the specification and the figures of the Application, the parasitic effects are placed on blue subpixels, but not on red or green subpixels [Appl. fig. 3]. However, as the Examiner interprets the claim limitation, "*the subpixels disposed at a boundary of the driver chip*", the described subpixels are more to be "Group A" [drawing 1 provided on page 8 of this Office

Action, which is equivalent to fig. 3 of the Application] subpixels rather than the blue subpixels. Appropriate correction is required.



Drawing 1

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. **Claims 1**, **2**, **6**, **8**, **9**, **13**, **15**, **16**, **20**, **22**, **23**, and **27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al. (US Pat. No. 6,326,981 B1, herein after referred to as "Mori") in view of Okuzono et al. (US Pat. No. 6,727,878 B2, herein after referred to as "Okuzono").

As to **claim 1**, Mori teaches a liquid crystal display [abstract] comprising:

a panel [drawing 2 shown on page 9 of this office action, which is equivalent to Mori's fig. 15] substantially comprising a subpixel repeating group (the subpixels included in the rectangular box drawn with solid lines) comprising an even number of subpixels in a row, the subpixel repeating group further comprising a column of dark colored subpixels (the subpixels included in the rectangular box drawn with dotted lines); and

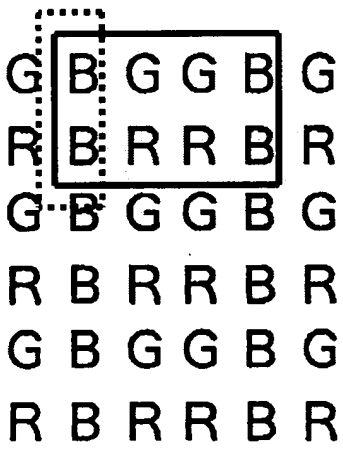
a driver circuit sending signals indicating image data to the panel [col. 1 lines 47-52]

Mori does not expressly disclose the signals indicating image data to have a polarity scheme.

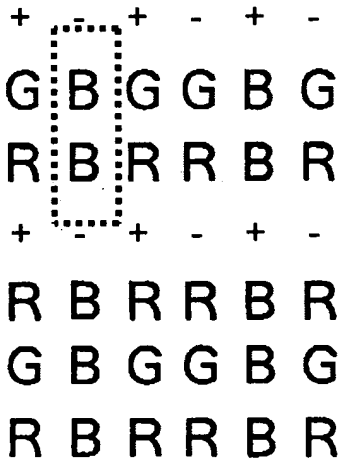
However, Okuzono [fig. 2] teaches a driving method of preventing horizontal stripes for a liquid crystal display, which comprises a method of driving plural subpixels with a polarity scheme [abstract] [col. 5 lines 47-50].

It would have been obvious to one of ordinary skill in the art at the time of the invention to adopt Okuzono's driving method for a liquid crystal display in Mori's display device in order to lower the power consumption, to prevent horizontal stripes, and to prevent the driving circuitries from being more complex [Okuzono: abstract].

Mori modified by Okuzono inherently teaches that any image degradation in the signals indicating image data is localized on a column of dark colored subpixels since the combination of Mori and Okuzono [drawing 3] would result in including two adjacent dark colored subpixels having a same color arranged in a column to be driven with a same polarity and thus the image degradation caused by driving two adjacent subpixels having a same color with a same polarity is localized on the dark colored subpixels.



Drawing 2



Drawing 3

As to **claim 2**, Mori modified by Okuzono teaches the dark colored subpixels being blue colored subpixels [drawing 2].

As to **claim 6**, most of the claim limitations have already been discussed with respect to the rejection of claims 1 and 2 except for a driver circuit having at least two phases.

Mori modified by Okuzono teaches a driver circuit having at least two phases [Okuzono: fig. 2] ("*positive, negative, positive, negative, ...*" for "n" and "n+1"th lines and "*negative, positive, negative, positive, ...*" for "n+2" and "n+3"th lines), wherein phases of the driver circuit are selected such that any parasitic effects (caused by driving two adjacent subpixels having a same color with a same polarity) placed upon any subpixels are placed substantially upon a plurality of same colored subpixels, as discussed with respect to the rejection of claim 1.

As to **claim 8**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

As to **claim 9**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 13**, all of the claim limitations have already been discussed with respect to the rejection of claims 1, 2, and 6.

As to **claim 15**, all of the claim limitations have already been discussed with respect to the rejection of claim 1.

As to **claim 16**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 20**, all of the claim limitations have already been discussed with respect to the rejection of claims 1, 2, and 6.

As to **claim 22**, all of the claim limitations have already been discussed with respect to the rejection of claim 2.

As to **claim 23**, all of the claim limitations have already been discussed with respect to the rejection of claims 2 and 22 as the Examiner notes that if any parasitic effects are placed upon all of blue subpixels, then any parasitic effects are inherently placed upon a subset of all blue subpixels.

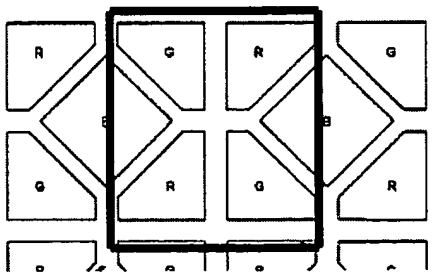
As to **claim 27**, all of the claim limitations have already been discussed with respect to the rejection of claim 6.

10. **Claims 3, 4, 10, 11, 17**, and **18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori and Okuzono as applied to claim 1 above, and further in view of Martin et al. (US Pat. No. 6,714,206 B1, herein after referred to as "Martin").

As to **claim 3**, the modified Mori [drawing 2] teaches the subpixel repeating group (the subpixels included in the rectangular box drawn with solid lines) substantially comprising red and green subpixels interspersed with two columns of blue subpixels.

The modified Mori does not expressly disclose a checkerboard of red and green subpixels interspersed with two columns of blue subpixels.

However, Martin [drawing 4 provided below, which is equivalent to Martin's fig. 2] teaches an arrangement of placing four subpixels (the subpixels included in the rectangle drawn with solid lines) having two different colors in a checkerboard pattern so that the two subpixels having a same color are not adjacent to each other in a horizontal direction and in a vertical direction.



Drawing 4

It would have been obvious to one of ordinary skill in the art at the time of the invention to adopt Martin's red and green subpixel arrangement in the modified Mori's display, in order to provide an uniform color illumination for a liquid crystal display by placing the four adjacent subpixels having two different colors in a pattern such that the two subpixels having a same color are not adjacent to each other in a horizontal direction and in a vertical direction.

As to **claim 4**, Mori modified by Okuzono [Okuzono: fig. 9] teaches the two columns of blue subpixels share a same column driver ("*source driver 106*").

As to **claim 10**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claims 4 and 8.

As to **claim 17**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 18**, all of the claim limitations have already been discussed with respect to the rejection of claim 11.

11. **Claims 5**, **7**, **12**, **14**, **19**, and **21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori and Okuzono in view of Nakano et al (US Pub. No. 2001/0052897 A1, herein after referred to as "Nakano").

Mori does not disclose one or more subpixels to receive a correction signal.

However, Nakano [fig. 2] teaches a principle of applying a correction signal to subpixels to adjust / compensate the offset occurred among three subpixels with different colors when a gray scale level of any 6-bit data are applied to the subpixels [par. 0041].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Nakano's method / principle of applying correction signals to the subpixels which have

relatively low luminance values, for the modified Mori's display, in order to equalize the luminance value of a subpixel having a color with the luminance value of another subpixel having different color, thus to provide an image with more precise brightness for the display [Nakano: par. (0041)].

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

October 6, 2006
S.M.

AMR A. AWAD
SUPERVISORY PATENT EXAMINER